FINAL SUMMARY OF THE U.S. NUCLEAR REGULATORY COMMISSION/U.S. DEPARTMENT OF ENERGY TECHNICAL EXCHANGE ON INFORMATION TO SUPPORT 10 CFR PART 63 ANALYSES FOR THE PROPOSED GEOLOGIC REPOSITORY AT YUCCA MOUNTAIN JULY 20, 2005 LAS VEGAS, NEVADA

INTRODUCTION

On July 20, 2005, the U.S. Nuclear Regulatory Commission (NRC) and the U.S. Department of Energy (DOE) held a public Technical Exchange (TE) to discuss the information to support 10 CFR Part 63 analyses for Yucca Mountain, Nevada. The meeting was held at the Atomic Safety Licensing Board Panel hearing facility in Las Vegas, Nevada. The agenda for this meeting can be found in Attachment 1.

To support staff and stakeholder interactions, the TE included video connections at NRC offices in Rockville, Maryland, the Center for Nuclear Waste Regulatory Analyses in San Antonio, Texas, and the Bechtel-SAIC Company, LLC, office in Las Vegas, Nevada. Teleconference connections were also made available to interested stakeholders.

Participants included representatives of the NRC, DOE, State of Nevada, Affected Units of Local Government, Nuclear Energy Institute, Electric Power Research Institute (EPRI), and other industry representatives, and members of the public. Attachment 2 contains the list of attendees who were present at the above noted locations.

PURPOSE OF THE TECHNICAL EXCHANGE

The purpose of this TE was to discuss the requirements of 10 CFR Part 63 related to the essential design requirements for the proposed geologic repository at Yucca Mountain, Nevada. The discussions focused on what information should be included in, or available for support, a potential license application (LA) and associated documents to support a decision by NRC on whether it should grant a construction authorization in accordance with 10 CFR 63.31. The decision whether to grant a construction authorization involves the review of many areas (e.g., safety of the design, emergency plan, and physical security), however, this TE focused only on the safety of the design. Attachment 3 contains the slides presented by NRC and DOE.

DOE SUMMARY AND CONCLUSIONS

The DOE presented and discussed its process on how safety requirements are identified, developed, and implemented in the design. This process was illustrated through the use of several different examples. The DOE also stated:

- The LA will contain General Information and a Safety Analysis Report in accordance with 10 CFR 63.21(a).
- The LA will describe surface and subsurface facilities and the engineered barriers in accordance with 10 CFR 63.21(c)(3).

- The LA or the supporting documentation will contain sufficient information to demonstrate the ability of SSCs to perform their intended safety functions in accordance with 10 CFR 63.112(e)(8).

- The LA will support a thorough NRC safety evaluation in accordance with regulatory requirements and will allow the NRC to arrive at a positive decision for a construction authorization in accordance with 10 CFR 63.31.

NRC SUMMARY AND CONCLUSIONS

- 10 CFR Part 63 requires one application with two regulatory decisions before a license to receive and possess high-level waste (HLW) could be granted. The first decision is whether or not to grant a construction authorization in accordance with 10 CFR 63.31. The safety decision associated with 10 CFR 63.31 analysis on the ability of the design to meet the analyses and performance objectives of 10 CFR Part 63, subpart E. The second decision is whether to issue a license to receive and possess HLW. This decision in part focuses on whether the facility has been fabricated and can be operated in accordance with the safety analysis and associated regulatory requirements.

- It is the responsibility of DOE to submit an LA that meets the regulatory requirements and is accurate in all material respects. The NRC stated that DOE's goal should be that it not receive any requests for additional information.

- 10 CFR Part 63 is a risk-informed and performance-based licensing process, not a deterministic licensing process. In lieu of general design criteria, the Preclosure Safety Analysis (PCSA) should determine the essential elements of the design (those elements required to demonstrate compliance with the performance objectives of 10 CFR 63.111) that should be contained in the LA.

- The LA should address the applicability of codes and standards used to demonstrate compliance with the performance objectives to the design of items important to safety (ITS) structures, systems, and components (SSCs).

- The examples presented by NRC during its presentation illustrated the types of information that may be required to make a safety decision in accordance with 10 CFR Part 63. The examples were based on the staff's understanding of DOE's current design, as documented in publicly available draft reports, to support the PCSA. The information required at the time of LA may vary based on the evolution of the design.

- Based on documents the NRC has reviewed to-date, the staff noted that simplified bounding analyses of ITS SSCs may not be sufficient to demonstrate that those SSCs will perform their intended function during an event sequence.

- For each of the design bases identified in the "Nuclear Safety Design Bases for LA" document, DOE should provide specific SSCs credited with the prevention or mitigation of event sequences and demonstrate that these ITS SSCs can perform their intended safety function at the time of LA.

- The DOE should provide reliability information and technical basis for operational requirements credited with prevention or mitigation of event sequences at time of LA.

- The LA should contain the basis for the reliability of active and passive ITS SSCs that are designed and fabricated in accordance with codes and standards. This is required to demonstrate that the related event sequences can be prevented or mitigated.

- The DOE should document the technical basis for addressing uncertainties in data and models of the PCSA at the time of LA.

- The DOE should document how it considered human reliability in the development of initiating events and event sequences at the time of LA.

- The DOE cited 10 CFR 63.102(f) as the rationale for using past licensing precedence, for nuclear facilities with comparable or higher risks, as the basis for the design of ITS SSCs. NRC noted that 63.102(f) pertains only to initiating events and not design requirements.

- The NRC and DOE should develop a better process to review, evaluate, and track preclosure technical issues.

- DOE continues to make progress in developing a design sufficient to demonstrate, through the PCSA, compliance with the performance objectives in 10 CFR 63.111. However, there still appears to be a lack of sufficient information regarding the use of codes and standards, and information to provide a link between the PCSA and the design.

STAKEHOLDER COMMENTS AND QUESTIONS

John Kessler, EPRI, noted that industry codes and standards, which have a factor of safety built-in, have been used for the design of nuclear SSCs for many years with the understanding that the facilities would perform their intended function when required. However, he expressed concern that when using codes and standards in a risk-informed regulatory process, such as 10 CFR Part 63, a reliability value should be applied to address the probability of failure of the SSC during event sequences.

Mr. Kessler also noted that EPRI and the NRC Office of Research, have been working on Probablistic Risk Assessments (PRAs) for 10 CFR Part 72 certified casks. These PRAs demonstrate that the risk of failure of these casks is very low. Mr. Kessler advised that the NRC should complete its 10 CFR Part 72 PRA and make it available publicly. Mr. Kessler also noted that in the future, if meetings are cancelled they should be noticed in a more timely manner. In addition, NRC should conduct a meeting to discuss the licensing review process before the fall/winter of 2005 as currently proposed by the staff. He suggested that the discussion of the licensing review process should cover through the decision whether to grant a license to receive and possess HLW.

Steve Frishman, State of Nevada, noted that he had obtained a report regarding the handling of spent fuel in air through a Freedom of Information Act (FOIA) request via a second party. He believed that the report would seem to cast doubts on many aspects of fuel handling. Mr. Frishman noted that the report should be made available to the Commission and the public. The DOE responded that the report was in the process of being made publicly available. Mr. Frishman expressed concern that the schedule for future technical exchanges, as presented by Joseph Ziegler, could be scheduled in a manner to better address significant safety issues. The NRC responded that it intends to review the meeting schedule and have a more definitive path forward.

Judy Triechel, questioned what was meant by DOE when it stated that it would "make information available to NRC." The NRC responded that any information required by NRC to make a safety decision will be made publicly available. Ms. Triechel also responded that there have been numerous problems with the Las Vegas monorail which was built to codes and standards and was concerned that building the geologic repository at Yucca Mountain to codes and standards would not be sufficient to ensure safety. The NRC responded that the staff will seek to clarify the use of codes and standards during this technical exchange.

ACTION ITEMS

The following action items were agreed to by NRC and DOE at the conclusion of the meeting:

- The DOE and the NRC agree to have additional discussions on the application of industry consensus codes and standards.
- The PCSA Technical Exchange, to be rescheduled, should include "human reliability" as a specific topic for discussion.
- The NRC stated it would present an overview of the licensing review process later in 2005.
- The NRC and DOE agreed to develop a process to review, evaluate, and track preclosure technical issues.

Date 8/2/05

Lawrence E. Kokajko, Deputy Director
Technical Review Directorate
Division of High-Level Repository Safety
Office of Nuclear Material Safety
and Safeguards
U.S. Nuclear Regulatory Commission

Date 7/28/05

Joseph D. Ziegler, Director
Office of License Application and Strategy
Office of Repository Development
U.S. Department of Energy